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MOBILE UNIT FOR TRANSPORT AND HANDLING OF OBJECTS, MORE PARTICULARLY FOR CEMETERIES
[ENGIN MOBILE DE TRANSPORT ET MANUTENTION D'OBJETS, PLUS PARTICULIEREMENT POUR CIMETIERE]

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Mobile unit for transport and handling of objects, more particularly for cemeteries

/1[1]

The present invention concerns a mobile unit for the transport and handling of objects, heavy and/or bulky objects in particular, especially for use in cemeteries.

At the present time there is an increasing trend toward constructing burial vaults and tomb monuments with the help of components prefabricated at a plant and then assembled on site. To date there no truly satisfactory means for transporting and putting these components in place in cemeteries, which generally offer very difficult access because of the little room existing in the majority of cases between burial vaults and graves. Generally one uses makeshift devices such as carts with three or four wheels, wheelbarrows, carts, and so forth, which makes the work tedious and extremely fatiguing for the operator. The use of small cranes installed on trucks unfortunately is possible only in rare cases where access is possible for this kind of crane.

The mobile transport and object handling unit, more particularly for a cemetery, in conformity with the invention does not have these kinds of disadvantages since it is

[1] Numbers in the margin indicate pagination in the foreign text.

particularly well adapted for the transport and handling of heavy and bulky objects in cemeteries. It is characterized in that it includes a telescoping crane shaft that is normally horizontal whose base component is articulated at its upstream end to a beam that normally is horizontal and carries a hydraulic autonomous pump motor group that supplies the unit hydraulic motor with fluid, the said beam being supported by a telescoping vertical leg that rests on the ground via the intermediary of a first horizontal shaft wheel, installed loosely in a fork joint cover, itself installed loosely about its vertical axis and receiving a manual drive shaft of the unit, a hydraulic jack connecting one point of the beam to one point of the base component to regulate remotely the value of the angle of which they form two sides, and the said base component being supported by a gantry crane beam that includes, on both sides of the component, two other telescoping vertical bases that rest on the ground, each one via the intermediary of an oblong horizontal box, which is capable of turning in a regulated manner about the first vertical shaft of the end that receives the telescoping vertical leg and of which a second vertical shaft at the other end receives, in an adjustable manner during rotation about this shaft, a fork joint that has a drive wheel whose horizontal shaft is driven by an individual hydraulic motor, the said unit being equipped with means of /2 remote control of the horizontal articulation jack and some jacks

that control sliding of its telescoping members, as well as some hydraulic motors associated with the traction wheels and the crane pole, and being additionally equipped with means for regulating and/or locking in angular position the said boxes and each of the fork joints that support them.

The invention will be better understood by referring to the following description of one example of implementation with reference to the attached drawings in which:

- Figure 1 is a partially sectional view in perspective of the unit of the invention;
- Figure 2 is a cut-away view along the direction II-II of figure 1 showing one of the two drive wheels and its hydraulic drive motor;
- Figure 3 shows the unit of the invention with its two drive wheels at their minimum inter-axle distance;
- Figure 4 shows the unit of the invention in dropped position and with its two drive wheels at their maximal inter-axle distance;
- Figure 5 shows the unit of the invention in lateral rolling position, with the load attachment point offset to the inside;
- Figure 6 is a diagram that allows one to explain how one offsets, as in figure 5, the attachment point of the load;

- Figure 7 shows the first phase of an operation of placing the unit, by its own means, on a truck bed, or any other carrier vehicle;
- Figure 8 shows the second phase of placing the unit on the said truck bed, in this case in travel position.

As one can see in figure 1 the transport and load handling unit of the invention is shown during handling of a prefabricated rectangular ring 1 that will form one of the components of a burial vault.

The handling member per se is comprised of a telescoping crane shaft 2 that includes a base component and a sliding component 4. The shaft 2 is normally horizontal as shown and its head is equipped with a hydraulic pulley block 5 equipped with a reeving loop 6 that supports load 1. As we shall see later, although the normal position, at least at rest, of the shaft 2, is horizontal position, one can also raise or lower it. In the traditional manner for telescoping shafts, control of sliding of component 4 in component 3 is effected by a double-action hydraulic jack 7, coaxial with and inside shaft 2. /3

The downstream end of the base component 3 rests, in fixed position, on the middle of a transverse beam 8 that forms the upper cross piece of a supporting gantry 9 of the shaft 2 that rests on the ground via the intermediary of the two front wheels 10, 11 of the unit. The two lateral sections of the gantry 9 are

essentially comprised of two posts, or legs, vertical and telescoping 14, 12 whose height is adjustable by some single-acting jacks 13. The lower part of each of the telescoping legs 14, 12 enters each one with a bearing 15, a support box 16, horizontal and oblong in shape, at one of the ends of each of these boxes, as shown in the drawing. Box 16 can turn about the leg, 14 or 13, that it supports with the help of a tangential wheel device 17 and endless screw 18, actuated in this example by a crank 19. In a more sophisticated variant the endless screw 18 could be actuated by a remotely controlled hydraulic motor, or it could be replaced by a toothed rack actuated by a double action hydraulic jack, which is also controlled remotely. A pin 20 allows one to lock each box 16 with respect to the leg that it supports 14 or 12. Each box 16 is itself carried by the associated wheel, 10 or 11, with horizontal axle held in a fork joint 21 that also enters, but from below in this case, the box 16, at its other end, and it can turn about the vertical shaft in an adjustable manner, here again with the help of a tangential wheel device 22, endless screw 23 and crank 24, here again capable of being replaced by some remotely controlled hydraulic means by the unit operator 25. Just as previously, it is possible to secure, by means of pins 26, each of the wheels 10 and 11 in a pre-determined angular position. Each of the wheels 10 and 11 is the traction type, being driven by a hydraulic motor

26, as in figure 2, one per wheel, placed in each of the covers 21 and controlled independently of one another remotely by the operator 25. One traction wheel 11 can therefore, if so desired, turn more quickly, or less quickly, than the other traction wheel 10.

The base of component 3 is provided with an articulation 27 to a beam 28, normally also horizontal, the obtuse angle between beam 28 and the component 3 being regulated remotely by the double action hydraulic jack 29 that connects one of the support collars 30 of a parallelepiped box 31 at the lower end of the component 3. /4

The box, or crank case, 31 has significant dimensions, as one can see in the drawing, and it contains a group 32 comprised of an independent heat engine, such as a combustion engine, and a hydraulic pump. The group 32 therefore assures the supply of the different parts of the unit (hydraulic jacks, hydraulic motors) with hydraulic fluid under pressure.

Beam 28, crank case 31, and the group 32 that it contains, are supported by a third post, or telescoping vertical leg 33 on which the beam is secured and rests by its opposite end at articulation 27. A third jack for controlling raising and lowering, identical to jacks 13 mentioned previously, is located inside the telescoping leg 33. The leg 33 rests on the ground via the intermediary of a wheel 34 with horizontal; shaft,

installed loosely in a cover 35, itself installed loosely about its vertical axis and receiving a unit hand-controlled steering shaft 36. A series of control buttons for the different hydraulic components (jacks, motors) of the unit are placed on the steering wheel 36, these control buttons not being visible in the figures, just as all of the hydraulic flexible lines that supply the various jacks and hydraulic motors of the unit are not.

During its operation, the operator 25 controls, from his steering position at the steering column 36 shown in the drawing, separate rotation of each of the hydraulic motors 26 that drive the traction front wheels 10, 11, in one direction of in the other also. He also controls from his position at the steering location 36 the extension and return of the jack shafts 29, simultaneously that of the two jacks 13, and of the lifting and lowering control jack of the rear leg 33, as well as operation of the winch motor 5 of course that equips the lower end of the shaft 2. The steering column 36 also allows him to guide the idle rear wheel 34.

We will now describe, with the help of figures 3 to 6, a few non-limiting examples of use of the unit of figure 1.

Figure 3 shows diagrammatically a position of the unit moving forward in a straight line in a narrow lane of the cemetery. Operator 25 has previously, after having removed pins

20, turned, with the help of the two cranks 19, the two boxes 16 by 180 degrees with respect to their position in figure 1, so that the two wheels 10, 11 are at their minimum inter-axle /5 distance e, and then the pins 20 were replaced to lock the boxes 16 in this position. In figure 1 the unit was raised and jack 29 adjusted so that the obtuse angle formed between beam 28 and component 3 is such that the wheels 11 and 34 move on the same path 37. In figure 3 the unit is always raised, but jack 29 is adjusted so that 3 and 28 are aligned, so that the path of the rear wheel 34 is the middle path of the paths of the front wheels 10 and 11. In this case the lateral space required on the ground for the unit and its operator is minimal.

Figure 4 shows diagrammatically a position of the unit with its front wheels 10, 11 separated the maximum as in figure 1, but with its three legs 14, 12, 33 lowered the maximum and components 3 and 28 aligned as in figure 3.

Figure 5 shows diagrammatically a position of the unit that differs from that of figure 4 only by the fact that the wheels 10 and 11 have been adjusted, by cranks 24, to be transverse as shown, and then locked in this position with the help of pins 26. The unit therefore advances transversely on transverse pathways 38, instead of advancing straight ahead as shown previously. One will note in addition that the unit is in raised position in this figure 5 and that the load 1 is transported between the front

legs 14, 12 and the rear leg 33, instead of being transported at the head of shaft 2 as was the case previously. The latter result is obtained, in conformity with a beneficial particular feature of the invention, being previously (see figure 6) detached from the head of shaft 39, so that the end 40 of the hoisting cable that carries the reeving loop 41, and having attached this end of cable 40 to a hook 42 located beneath component 3, toward the front end of the latter: the reeving loop 41 is then offset upward, as one can see in figure 6, which allows one to transport the load 1 as shown in figure 5.

Finally we will explain, with the help of figures 7 and 8, how one loads and unloads the unit of the invention on a truck platform, or other transport vehicle with platform.

Figure 7 shows the first phase of this loading operation. One brings first the unit into the position shown with respect to platform 43 of the truck. The unit is then raised and its front legs 14, 12 are against the rear edge of the platform, while its rear leg 33 is brought, by means of jack 29, against the lateral right edge of the platform 43, a notch 44 advantageously being provided at this spot so that one can set the leg 33 in it. /6

The three legs 14, 12, 33 being well supported against the edges of the platform 43 one can secure there, in their high part, some support lugs 45 of the unit on the top of the platform

43, or one can use any other means of solid attachment of the legs to the platform.

One can then control, by the corresponding jacks, the raising of the three legs 14, 12, 33 in such a way that the wheels 10, 11, 34 are raised with respect to the ground, the unit resting then on the platform by the lugs 45, as one can see in figure 8. Advantageously, as shown in figure 8, one can turn by 180 degrees the two boxes 16 in order to return the front wheels 10, 11 of the unit between the two front legs 14, 12. One then obtains, as one can see in figure 8, a traveling position that adheres to roadway outside dimensions. /7

CLAIMS

1. Mobile unit for the transport and handling of objects, heavy and/or bulky objects in particular, especially for use in cemeteries, characterized in that it includes a normally horizontal telescoping crane shaft whose base component (3) is articulated at its higher end to a normally horizontal beam (28(that has a hydraulic independent pump motor group (32) that furnishes a supply of hydraulic motor fluid for the unit, the said beam being supported by a telescoping vertical leg (33) that rests on the ground via the intermediary of a first wheel (34) with horizontal shaft, instead loosely in a protective cover (35), itself installed loosely about its vertical axis and

receiving a manual steering column for operating the unit, a hydraulic jack (29) that connects one point of the beam (28) to one point of the base component (3) in order to adjust remotely the value of the angle of which they form the two sides, and the said base component (3) being supported, by a gantry (9) that includes, on both sides of the component (3), two other telescoping vertical legs (14, 12) that rest on the ground, each one via the intermediary of an oblong horizontal box (16), which can turn in an adjustable way about a first vertical shaft of the end that receives the telescoping vertical leg (12, 14) and in which a second vertical shaft at the other end receives, in an adjustable manner by rotation about this shaft, a protective cover (21) that has a traction wheel (10, 11) whose horizontal shaft is driven by an individual hydraulic motor (26), the said unit being equipped with means for remote control of the horizontal articulation jack (29) and some jacks (13) that control sliding of its telescoping members, as well as some hydraulic motors associated with the traction wheels and with the crane shaft, and being also equipped with means (7-20, 22-24, 6) for adjustment and/or locking in angular position the said boxes (16) and each of the wheel protective covers (21) that they support.

2. Unit according to claim 1 characterized in that it includes, on the base component (3) of the crane shaft (2), an attachment member (42) of the end (40) of the hoisting cable.

3. Mobile unit according to one of the claims 1 or 2 characterized in that it is associated with members (45) for making a solid connection of its telescoping legs (14, 12, 33) to a platform (43) of the carrying vehicle, the wheels (10, 11, 34) of the unit then being raised above the ground in transport position by the unit's own hydraulic devices.

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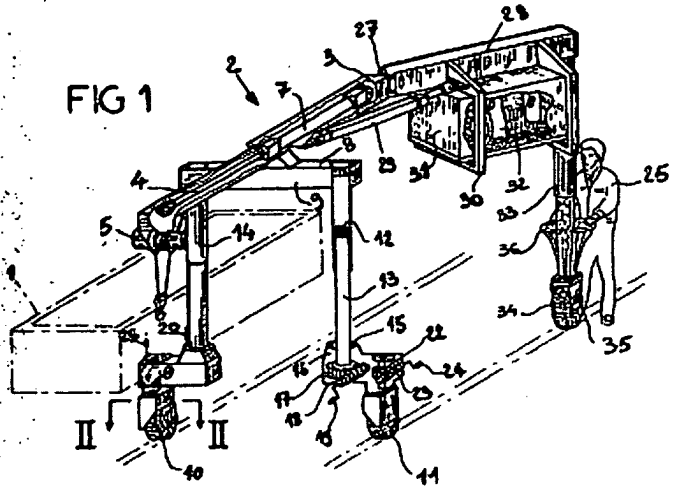
FIG 1



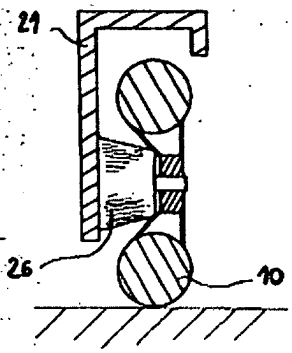


FIG 2

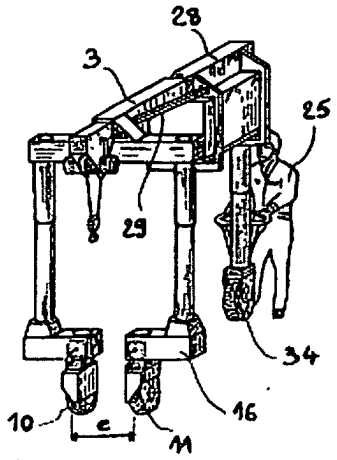


FIG 3

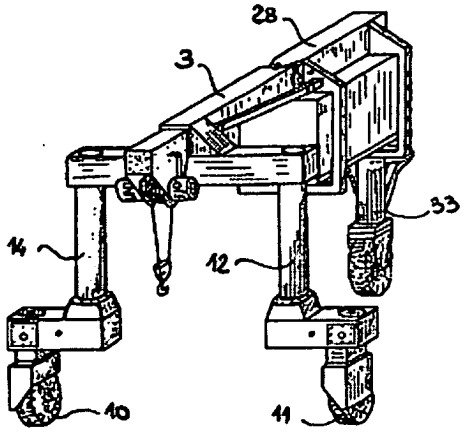


FIG 4

FIG 6

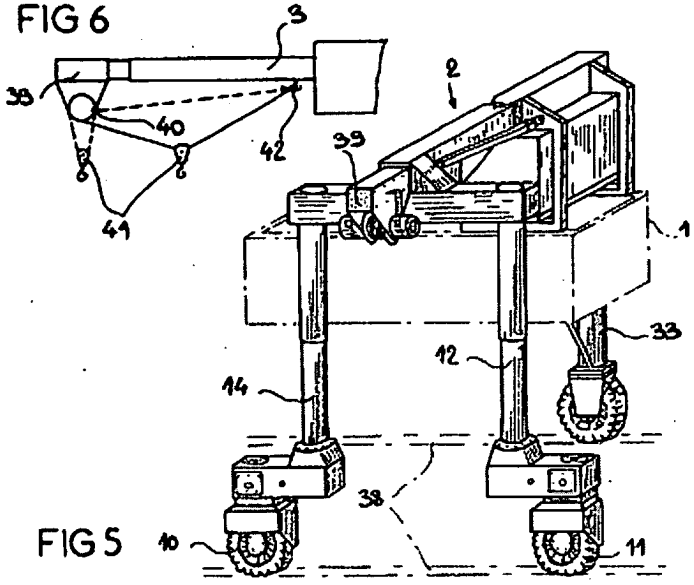
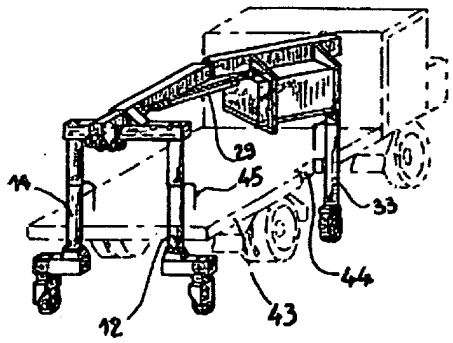


FIG 5

FIG 7



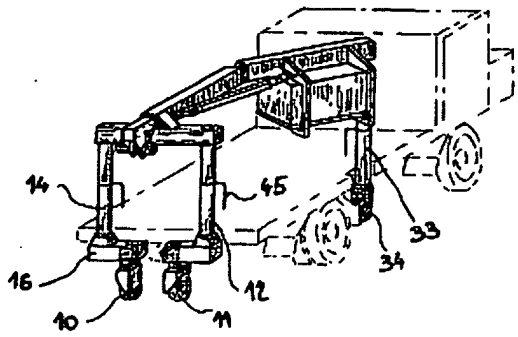


FIG 8